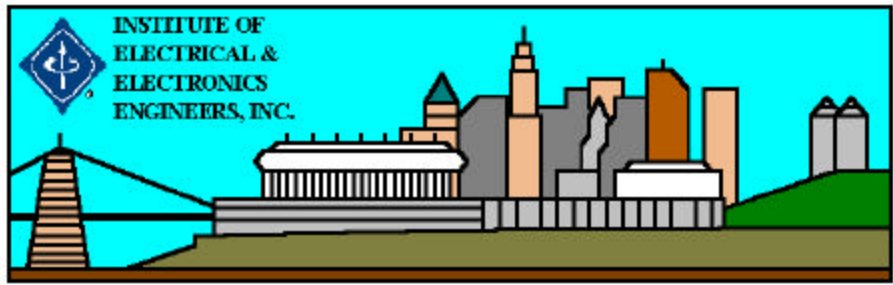


**IEEE CINCINNATI
SECTION
NEWSLETTER
MAY 2002**



**MAY MEETING
SENIOR PROJECTS**

DATE: Thursday, May 23, 2002

PLACE : Raffel's – 10160 Reading Road (see below for directions)

TIME : 5:30 p.m. to 7:00 p.m. - Social Time/Dinner
7:00 p.m. to 8:30 p.m. - Program

COST FOR DINNER: \$15.00 which includes a buffet dinner, soft drinks/coffee, tax & gratuity.
Cost for student members - \$10.00

MENU SELECTIONS: Maryland Crab Cakes, Center Cut Chops with Baked Apples, Country Fried Chicken, Broccoli & Carrot Casserole, Buttered Corn, Whipped Potatoes with Gravy, Tossed Salad with Dressings, Rolls & Butter, Apple Dumplings, Coffee, Tea Iced Tea, Soft Drinks. There is also a bar available for the purchase of alcoholic drinks. Raffel's is located at 10160 Reading Road, south of Glendale-Milford Road on the east side of Reading. Take I-75 to the Glendale-Milford Rd. Exit, go east on Glendale-Milford Road approximately 3/4 of a mile to Reading Rd. and turn right on Reading.

Please call the Cincinnati Section Voice Mailbox at 513-629-9380, by **Noon, Tuesday, May 21, 2002** if you plan to attend. Please leave your **Name, IEEE Member Number, and a daytime telephone number.**

ABOUT THE PRESENTATION: This month's meeting of the Cincinnati Section will feature Electrical and Computer Engineering Technology Senior Design Projects from the University of Cincinnati's College of Applied Science, 2002 Technology Exposition. The Senior Project sequence at the college is a capstone experience for Bachelor of Science candidates. The program will consist of a brief overview of the Senior Project sequence followed by student presentations. Projects will be selected to illustrate the diversity of student interests. Each presentation will be limited to fifteen minutes. This meeting provides an opportunity for Cincinnati Section members to meet students and to discuss aspects of technology education with the UC faculty.

CHAIR'S MESSAGE

by Tom Grau, Section Chair

The feature presentation at our Section Meeting on April 27 was given by Mr. Dick White, who covered the ancient history of photography (ten years ago and more), the magic behind how digital cameras work, key features of digital cameras such as resolution, optical telephoto lenses, memory cards, controls, and batteries to name a few of the topics covered. On behalf of the Cincinnati Section I congratulate Dick White on his fine presentation and thank him for a most enjoyable evening. Randy Holt has posted Mr. White's presentation slides on our web site at [Http://ieee.cincinnati.fuse.net/](http://ieee.cincinnati.fuse.net/).

Allow me to again state the Executive Committee's mission and vision.

Our Mission:

To serve the membership of this Section and to support the Societies that our members belong to.

Our Vision:

To enrich our member skills through program presentations of current technologies and issues.

TO SUBSCRIBE TO THE ELECTRONIC NEWSLETTER

This newsletter is only available via e-mail or the Section's web page at <http://ieee.cincinnati.fuse.net/> with the exception of new Section members (one issue only) or members who have specifically requested a copy be delivered through the U. S. Mail.

If you are a new Section member and would like to get this newsletter electronically, please contact Bob Morrison (Editor) at **513-287-3697** or by e-mail at j.r.morrison@ieee.org. Provide your name and member number. In case there are questions, please include a daytime telephone number as well.

If you would like the "Snail Mail" version, you must contact Bob Morrison via the above means or call the Section's voice mail at **513-629-9380**.

NEW MEMBERS

The following individuals are IEEE members who are new to our Section:

JOSEPH P. ANDERSON	BRETT T. HOLLYWOOD	BRIAN C. MOORE
PETER BROOME	MOHAN IRVATHRAYA	MICHAEL S. NELSON
WILLIAM P. CAPPEL	TODD A. JOHNSON	DOUGLAS P. PHILLIS
SRIKANTH CHILUKURU	DONNIE A. LAND	JOHN E. STURM JR
KATHERINE T. DURACK	LOU LITTLE	GEORGE A. VOGEL
JOSE A. RAMIREZ HERNANDEZ	JOHN A. LONGBRAKE	YANLI YANG
	KEITH B. MCCONNELL	

We wish to extend our welcome to all of our Section's new members!!!

ATTENTION Retired Engineers and Scientists!
Consider RESC Activities !

The **Retired Engineers and Scientists of Cincinnati - RESC** for short - invite those with **technical back- grounds** who are **retired** and would like to **share good fellowship** while **pursuing interests** in technology, community, history and nostalgia, travel, and business or industry developments.

Activities include monthly **luncheon meetings**, periodic **plant tours**, and **golf** in season. Luncheon meetings are held on the third Tuesday of each month from October through May.

Visit website <http://RESC-online.org> for the "big picture" of RESC

LUNCHEON MEETING SCHEDULE -

Tuesday, May 21
CENTRAL

11:30 AM

88 Bells for Ohio Bicentennial (NOTE: AT QUALITY

HOTEL, NORWOOD) James Verdin, President, Verdin Bell Co. will describe how between now and 2003 his company will cast on location, by use of a unique mobile foundry in each of the 88 counties, a 230 pound bell bearing the name of the county, the casting date, the Great Seal of Ohio, and the Bicentennial

PLANT TOUR SCHEDULE

Tours are limited to RESC Members and Member sponsored Guests

Thursday, May 16 TOYOTA AUTO ASSEMBLY PLANT, Georgetown, Kentucky

General information about RESC and supplemental information about events
is available on website: <http://RESC-online.org>

Scanning the Past: A History of Electrical Engineering from the Past

Submitted by Dick Reiman, Historian

Copyright 1992 IEEE. Reprinted with permission from the IEEE publication, "Scanning the Past" which covers a reprint of an article appearing in the Proceedings of the IEEE Vol. 80, No. 1 January 1992.

The PROCEEDINGS Nears Eighty

The year 1913 was a propitious one for the founding of a publication intending to concern itself with dissemination of information on wireless telegraphy or radio. This was as yet a frail branch of electrical engineering, supported only by incomplete understanding of its basic theory, and plagued by patent litigation spanning several continents. Even the inventor of the field's most promising device, the vacuum triode, did not well understand its functioning. Thus the need for furthering the spread of knowledge in the field could not have been greater .

To be known as the PROCEEDINGS OF THE INSTITUTE OF RADIO ENGINEERS, the publication arrived on the world scene as the result of a merger of two struggling societies - the Society of Wireless Engineers of Boston, and the Wireless Institute of New York. The merger was the culmination of efforts by three men, Robert H. Marriott, John V. L. Hogan, and Alfred Goldsmith. If Marriott and Hogan were nurses at the birth, Goldsmith was certainly the attending physician; the event bears marks of the latter's innovative leadership. One was the understanding that radio was not limited by national boundaries - that the word American was not appropriate for the title (a principle which carried over to the later merger which led to the IEEE). The second was that publications would be the major means of building the profession, and the position of Editor should be included among the Constitutional Officers. Alfred Goldsmith, at age 23, was chosen as the first Editor, and he continued in the post for over four decades until he retired with the title of Editor Emeritus in 1953. He had received his doctorate at age 21 from Columbia University and had taught there and at City College of New York. He became a gemologist of repute (this writer was in attendance at IRE Board meetings in New York when he received telephone queries from Tiffany's). He would later hold patents on the

first two-dial radio receiver and on the shadow-mask tube for color television. Goldsmith had access to abroad array of technical people, and he was able to persuade well-connected engineers and scientists to contribute papers to the PROCEEDINGS.



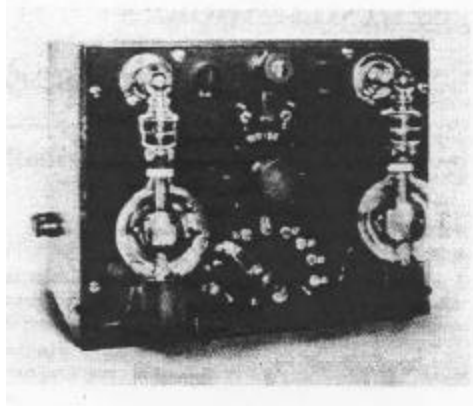
An early portrait of Alfred N. Goldsmith, the founding Editor of the PROCEEDINGS. Goldsmith served as editor for 41 years, after which he held the title of Editor Emeritus for over two decades until his death in 1974. (Photograph courtesy of IEEE Center for the History of Electrical Engineering.)

The IRE was founded near the end of the age of spark transmitters, when arcs or radio alternators were becoming the favored means of high-power generation for transmitters. In 1912 detectors for radio signals had advanced to the carborundum-crystal level or to the gaseous three-element audion of Lee de Forest - neither were paragons of sensitivity or stability. De Forest clung to his gaseous audion and the use of a positive grid voltage. But a young inventor, Fritz Lowenstein, had a patent on the use of the triode with negative grid voltage. He crossed trails with E. F. W. Alexanderson of General Electric, who asked for a sample tube that he turned over to Irving Langmuir of the G. E. Research Laboratory. Langmuir saw possibilities in the device, foreseeing that if it were pumped to a very high vacuum, and a negative grid bias were used, the audion would become a stable and predictable device.

Beginning with a paper by Langmuir in 1915 (the three-halves power law of the diode), the PROCEEDINGS was to chronicle the development of the vacuum tube over its life span of approximately 50 years. Work similar to Langmuir's was carried out by Harold D. Arnold of the Bell Company. The triode developed by Arnold was instrumental in the success of the first (1915) Bell system transcontinental telephone line, being the first successful repeater. Edwin H. Armstrong published his paper on regeneration in the PROCEEDINGS in 1915, which set off many years of technological litigation.

The selection of the optimum operating frequency for long distances was a vexing problem in the early years. In Marconi's equipment the antenna was part of the tuned circuit, and as he went to larger antennas for greater distances,

he moved to lower frequencies. He believed the lower frequencies to be necessary for long distance. This choice was challenged about 1922 by radio amateurs using much shorter waves, which benefited from reflections from the ionosphere.



A photograph of the audion receiver, reproduced from
"The Audion Detector & Amplifier" by Lee de Forest
from the March 1914 issue of the PROCEEDINGS.

The original intent had been for the PROCEEDINGS to publish papers presented before meetings of the Institute, but this policy was gradually abandoned under pressure of numbers of papers and the need for prompt publication reporting research progress. Inherently possible with invited papers was the compilation of special issues, devoted to a single important topic. The first such issue, of 400 pages, appeared in October 1951 on the subject of color television. There have now been over 150 issues, with the largest in May 1962, commemorating the 50th anniversary of the founding of the I.R.E. This issue was organized by Editor Emeritus Goldsmith, called back to duty. The way for this had been prepared in 1958, when this writer, as Editor, asked the Board of Directors to commit future funds to cover the costs of what developed into a 1200 page issue.

The changing make-up of the profession served by the PROCEEDINGS during its nearly 80 years may be seen by considering an early issue raised in its pages: Who were properly included as "radio engineers"? As first raised, the question concerned whether to include telegraph and telephone engineers; this was ultimately resolved by their inclusion along with radio engineers as "communications engineers." The subject surfaced again after World War II, this time concerning engineers and scientists whose interests transcended communications. The issue was perhaps finally resolved by the merger of the IRE and the AIEE, when all those concerned with the electron or its waves were covered by the phrase "electrical and electronics engineers." Today the scope of the IEEE embraces all electrical, electronics, and computer engineering - from algorithms and codes, through control and power systems, to electromagnetics and lightwave technology.

John D. Ryder

John D. Ryder, former dean of engineering at Michigan State University, now retired, was twice Editor of the PROCEEDINGS, 1958-1959 and 1963-1964. He is the author of several books, the most recent (with Donald G. Fink) being *Engineers and Electrons*, IEEE PRESS, 1984.

ELECTRICAL WORLD MAGAZINE

125th ANNIVERSARY

by Bob Morrison, Editor

In 1999, Electrical World Magazine celebrated their 125th anniversary as one of the premier publications for the Electric Power Industry. They presented a history of significant People, Companies, Industry Changes and Innovative Technologies which have served to define the current status of the Electric Power Industry. In the next few months, their article will be reprinted in this *newsletter* (permission granted by McGraw-Hill Publishing Co.)

INDUSTRY

An industry defined by milestone events

Public power

In May 1933, the Tennessee Valley Authority (TVA) was established. Its purpose was threefold: to weaken the electric power monopoly; to stimulate the country's stagnant economy; and to provide jobs for the unemployed while electrifying rural America. Perhaps the most significant moment in the history of public power, the formation of TVA was the federal government's first foray into electric power generation. The advantages of federal power -- its affordability and reliability -- made it a highly desirable commodity.

Puhca passage

President Roosevelt's strong dislike for trusts culminated in the passage of the Public Utility Holding Company Act (Puhca) in 1935. The new law allowed the government to restructure the industry, substantially reducing the powers of the large holding companies.

At the same time, the Securities and Exchange Commission was ordered to realign holding companies. Puhca instructed that each company was to be restricted to a limited geographic area. This shift, which began in the mid-1930s, defined the industry for the next 60 years. Only in recent times has competitiveness been allowed once more to raise its head.

The nuclear age

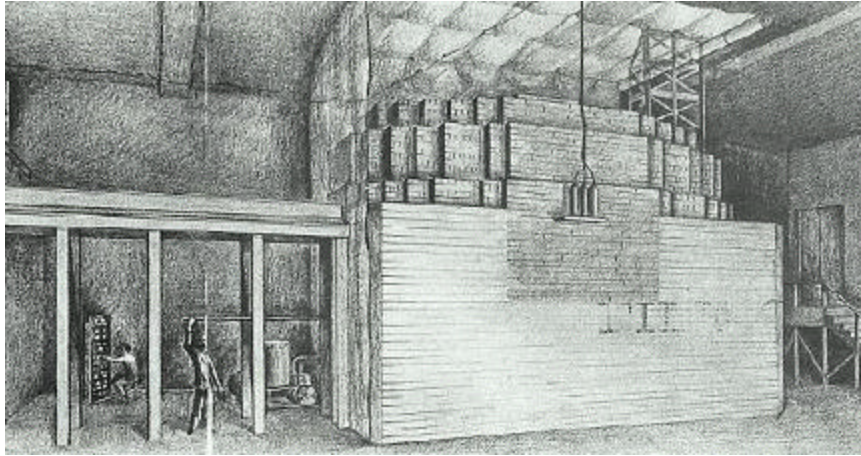
After the public power revolution and passage of Puhca, US utilities faced the onslaught of World War II and an economic boom that promised decades of success. The unexpected bonus was nuclear power.

Enrico Fermi came to the US in 1939 to protect his wife, Laura, who was Jewish, from the terrors that threatened Europe. Fermi, recipient of the 1938 Nobel Prize for physics, had already gained international fame. In 1934, while experimenting in his native Italy, he and several of his students bombarded uranium atoms with newly discovered neutron particles. The reaction produced new radioactive materials, which many mistakenly believed were heavier elements.

What Fermi had actually done was split the nucleus of the atom, inadvertently unleashing the potential for the first nuclear weapon. By 1938, the Germans had succeeded in duplicating Fermi's experiments. Fermi, along with Albert Einstein and Leo Szilard, wrote to Roosevelt warning of the terrific dangers of nuclear energy falling into the wrong hands. Roosevelt, in turn, authorized US teams to explore and harness fission.

On Dec 2, 1942, underneath an abandoned football stadium at the University of Chicago, Szilard and Fermi's Chicago Pile-1 -- the world's first nuclear reactor -- went critical. With that, nuclear power was born. After the war, the US government created the Atomic Energy Commission to oversee the peaceful development of atomic and nuclear technology.

Over the next decade, nuclear energy became increasingly realistic. On a cold December day in 1951, near Arco, Idaho, the Experimental Breeder Reactor-I -- built by San Francisco-based Bechtel Group Inc -- generated usable electricity.



*Chicago Pile-1, the world's first nuclear reactor,
was built under an abandoned football field*

By the late 1970s, there were more than 100 nuclear powerplants across the country. Nuclear energy, from an air-quality perspective, was a clean, renewable form of energy. John W Simpson, former president of Westinghouse Power Systems, called it "the best energy source we have."

IEEE NEWS

IEEE Virtual Museum

Piscataway, NJ -- Thomas Edison didn't invent the light bulb, so why does everyone think he did? What was the first computer? How did the patterns in a Utah cornfield lead to the development of TV? What is the "X" in an X-ray? Why are Alvin and the Chipmunks part of a museum about technology?

The answers to these questions and more are found in the new IEEE Virtual Museum launched at <http://www.ieee.org/museum>. Designed for educators, pre-college students, and the general public, the virtual museum debuted with two exhibits containing audio and video clips, and interactive features: Socket to Me! How Electricity Came to Be and The Beat Goes On: How Sounds are Recorded and Played.

Three more exhibits are in production and are scheduled for release by third quarter 2002. These will explore the different applications of microwaves, the works of Thomas Edison, and contributions women have made to electrical and information technologies.

The IEEE Virtual Museum explores the global social impact of electrical and information sciences and technologies and demonstrates the relevance of engineering and engineers to society. It is supported by the IEEE Foundation, the IEEE Life Members, and the Trustees of the IEEE History Center.

NEW EDITION OF *IEEE-USA TODAY'S ENGINEER* IS LIVE ON THE WEB

IEEE-USA TODAY'S ENGINEER has a new look and now includes content formerly published in IEEE-USA POLICY PERSPECTIVES, including articles and commentary on the topics that are shaping legislation, the technology workplace, and the engineering world. This month's edition of TODAY'S ENGINEER includes:

Building Careers

- JOB SEARCH STRATEGIES -- PLANNING FOR RESULTS
- IEEE SOCIETY CONFERENCES & THEIR VALUE TO YOUR CAREER
- BACKSCATTER: REALITY AND THE VIRTUAL ENGINEER

Shaping Public Policy

- INTELLIGENCE: BALANCING THE TECHNIQUES AND THE COSTS
- CONGRESSIONAL VISITS DAY: THEME ATTUNED TO THE TIMES

Also this month in TE:

- Engineering Trends: Do Engineers and Customers Mix?
- Engineering Hall of Fame: Hugo Gernsback
- World Bytes: How Can You Value What You Cannot Touch?

To read TODAY'S ENGINEER, visit: <http://www.todaysengineer.org>

IEEE-USA ENDORSES SENATE BILLS ON HOMELAND SECURITY

WASHINGTON (April 24, 2002) - In testimony before a hearing of the Senate Subcommittee on Science, Technology and Space on homeland security and technology, IEEE-USA endorsed two Senate bills designed to provide a coordinated technology response in the event of a major emergency, and strengthen our nation's security against computer attacks.

Ron Hira, chair of the IEEE-USA Research and Development Policy Committee, testified in support of S. 2182, the Cyber Security Research and Development Act. IEEE-USA previously backed a companion bill (H.R. 3394), which passed the House of Representatives by a vote of 400-12 on Feb. 7. The cyber security bills would create new research and education programs to address the nation's extraordinary vulnerability to attacks upon computer systems and networks, and the critical national infrastructures that rely upon them (e.g., water systems and electricity grids).

IEEE-USA believes the Act will pay dividends not only for protection against cyber terrorism, but for commerce and personal privacy as well. "In order to advance the state of the art and the state of the market, we need to advance the state of the science in cyber security," Hira said before the Subcommittee on Science, Technology and Space of the Senate Committee on Commerce, Science and Transportation. "IEEE-USA is pleased to support S. 2182."

IEEE-USA also endorsed the objectives of S. 2037, the Science and Technology Emergency Mobilization Act. The purpose of the Act "is to mobilize America's extensive capability in technology and science in responding" to terrorist attacks and other major emergencies.

"The concept of organizing to focus the nation's technology resources to address the response to terrorist attacks and other emergencies is an important ingredient in a robust homeland defense," Hira said. "The challenge, however, is in coordinating the response, finding the necessary experts and supplies, and getting them into place as quickly as possible."

Hira's testimony can be accessed at <http://www.ieeeusa.org/forum/policy/02april24.html>.

IEEE SPONSORS FOUR STUDENT MEMBERS FOR PRESTIGIOUS WASHINGTON INTERNSHIPS FOR STUDENTS OF ENGINEERING

WASHINGTON (March 21, 2002) - IEEE-USA, in collaboration with the IEEE Technical Activities Board and the IEEE Life Members Committee, is pleased to announce IEEE sponsorship of four IEEE Student Members in the prestigious Washington Internships for Students of Engineering (WISE) Summer 2002 program. Participating for the IEEE are:

- Jason Fredericks, an engineering science and physics major at Trinity University in Texas. Fredericks plans to explore the role that powerline broadband can play in bridging the digital divide.
- Trampas Kurth, an electrical engineering major at Kansas State University. Kurth is interested in how the Internet has changed the dynamics of intellectual property and fair use policies.
- Davis Richard Thompson, an electrical engineering major at Columbia University. President of the IEEE student branch at Columbia, Thompson will investigate current genomics legislation and issues related to integration of technology and biology.
- Max Vilimpoc, an electrical engineering major at the Ohio State University. Vilimpoc brings to Washington an interest in cryptography, intellectual property and equal access policy issues.

Three additional IEEE student members are participating in WISE 2002 under sponsorship of other engineering societies. Andrew Lilly, of the University of Arkansas at Fayetteville, is sponsored by the Society of Automotive Engineers. Tolani Owusu, of the University of North Carolina-Charlotte, is sponsored by the National Society of Professional Engineers. Mark Rice, of Kansas State University, is sponsored by the American Association of Engineering Societies.

Each year, WISE brings 14-16 outstanding engineering students to Washington, DC for 10 weeks to learn how government officials make decisions on complex technological issues, and how engineers can contribute to legislative and regulatory public-policy decisions. WISE Interns research and present detailed policy papers on such topics as federal strategies to encourage rural broadband access or ensuring electric reliability in deregulated markets. The summer 2002 program begins on 28 May. For more information on the WISE Internships, visit the WISE website at <http://www.wise-intern.org>; or contact Chris Brantley, IEEE-USA's Director of Government Relations, at c.brantley@ieee.org.

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